REMARKS

This amendment is responsive to the official action of February 26, 2004, wherein certain objections were made and the claims were rejected as anticipated or obvious from US Pat. 6,173,995 – Mau, alone or combined with US Pat. 4,437,691 - Laney.

The examiner points out that the listing of prior art in the specification is not a proper information disclosure statement. Applicant filed a proper information disclosure statement, form PTO-1449 and references on February 2, 2004. Apparently the document had not yet reached the official file at the time of the official action. Applicant requests that the references be considered to the extent that they were not already considered and cited by the examiner on the form PTO-892.

Objections were made to the claims for phrases lacking antecedent basis or considered indefinite. Applicant has corrected the term in claim 1 and has adopted the examiner's suggestion for claim 4. Claims 11-17 have been canceled, without prejudice, rendering those objections moot. The claims as amended are definite.

In amending the claims, applicant has placed claim 3 in independent form. However the number of claims remains within the number for which filing fees have already been paid. No new matter is presented.

In the rejections over prior art, the examiner has relied on Mau (US 6,173,995) for a conical surface forming an edge, and Laney (US 4,437,691) for a compressible gasket. Reconsideration and withdrawal of the rejections are requested. Neither Mau nor Laney, nor any of the other references of record, teach an arrangement wherein a sharp edge that is formed between a conical edge and an annular groove, is opposed to an axially facing surface of a retainer advancing the corrugated tubing. Therefore, although Mau has a conical surface and an edge, the reference fails to meet the invention claimed as a whole.

Applicant's invention as illustrated, for example, in Fig. 6, has a fitting body 40 with a conical surface 94 inside an annular groove, thus forming an edge 90. During tightening of the nut 55 on body 40, the edge 90 encounters and deforms the endmost corrugation of the tubing. To that extent, applicant's invention resembles the prior art as shown for example in Mau. Unlike the prior art, however, applicant's edge 90 opposes an axial face 104 of the retainer that urges the tubing toward the bottom of the opening in the fitting body 40. As defined in applicant's claims, the sharp edge 90 and the opposed axial face 104 form a narrow nip around the circle defined by the sharp edge, shown in Fig. 6.

This sharp edge sealing technique has several beneficial results in the context of applicant's invention that are not found or suggested by the prior art including Mau. The sealing pressure is applied acutely at the nip between the sharp edge 90 at the apex of two oppositely conical surfaces on the fitting body, versus the opposed axially facing surface 104 of the retainer, thereby forming a hermetic metal/metal seal. The rolled-over corrugation or loop that remains in the endmost engaged corrugation, is formed into a toroidal bead outside the sealing line, rather than being flattened as if engaged between opposed clamping surfaces as in a vise. The bead extends into the annular groove, i.e., the gap between the sharp edge 90 and the outside wall of the fitting body, which gap extends axially beyond the sharp edge 90. The bead of the rolled-over corrugation compresses and seals with a compressible gasket 45 in the annular groove.

The operative surface for the compressible gasket seal, namely the surface that lays against the gasket material in the annular groove, is the outer surface of the toroidal bead and is generally clear of irregularities associated with the cut edge. As a result, there are distinct seals formed with compression of the gasket by the bead and the metal/metal clamping of the sharp edge 90 against the axial facing surface.

The Mau reference lacks a sharp edge acting against an opposed axially facing surface as defined in applicant's claims 1 and 18. Mau does not meet the invention claimed as a whole. The Mau reference is not structured to form a toroidal bead, and operates instead in a vise-like way to flatten the endmost corrugation between parallel

conical surfaces that are forced together in an axial direction. Thus, the Mau reference cannot be said to disclose or to suggest the possibility or potential advantage of using sharp edge metal/metal seal between a sharp edge and an abutting opposed surface, tightened to provide a bead that bears against a compressible gasket material as in applicant's claims 3 and 19. The Laney reference cited in combination with Mau has a compressible O-ring gasket, but Laney's gasket is not placed or intended to interact with a bead formed by compressing a corrugation at the end of the tube. Therefore, the prior art fails to meet aspects of applicant's invention as a whole, as particularly and distinctly claimed.

Applicant's claims define an inwardly conical surface surrounded by an annular groove. The Mau reference teaches inwardly and outwardly conical surfaces, the inner one being termed the "interior stop shoulder" 22. Mau does not teach or suggest using an apex such as the apex between inner and outer conical surfaces as a sharp edge opposed to an axial facing abutment for sealing. Mau lacks such teaching because Mau's facing edge on the retainer is parallel to one of the conical surfaces on the fitting body. The face of the retainer is not opposed to the apex or sharp edge. Thus although an apex or sharp edge can be found in Mau (the cusp between inner and outer conical surfaces), that edge is not opposed to the retainer and does not form a nip or point of concentrated pressure against an opposed axially facing surface.

Instead, Mau's seal is a flat clamping seal made over a distance along the endmost corrugation. The maximum diameter curve of the corrugation is flattened between complementary conical surfaces of the interior stop shoulder 22 and the complementary conical end 40 of the retainer ("split bushing assembly" 32). See col. 4, lines 37-39: "a first end 40 which is engageable with the radially inwardly extending internal stop shoulder 22 of the adapter 14 . . .."

An operationally similar vise-like clamping arrangement is shown in US Pat. 6,276,728 – Treichel. In Treichel as in Mau, there are complementary opposite conical faces on the fitting body and on the end of the retainer. The endmost corrugation is flattened between the oppositely conical faces, which act as the faces of a vise. The

result is a two-thickness fold in the tubing that is compressed flat between facing surfaces (not edges) of the respective fitting body and retainer. The seal pressure is spread over a broad surface. There is no possibility of using a bead to compress a gasket alongside of the area of compression to obtain a supplementary additional seal barrier.

Mau differs from Treichel in that Mau has two conical faces on the fitting body, coming to an cusp, namely an inward conical surface leading up to the outward conical surface that is used for clamping the flattened bead against the retainer. As a result, the fitting body has a sharp edge between the inward and outward conical surfaces. Mau does not mention or describe the edge, but it appears from Mau's Figs. 2 and 3 that the sharp edge may help to pick up the extreme edge of the tubing during the process of flattening the endmost corrugation. In any event, the sharp edge in Mau is not opposed to a surface of the retainer and does not provide a sharp edged sealing line. The sharp edge in Mau occurs along the perimeter of a sealing surface that has a wide vise-like area extending along the width of the complementary conical surfaces at which the fitting body and the retainer clamp together on the flattened bead.

Therefore, Mau does not disclose the invention as a whole, particularly defined in applicant's claims.

The aspect of applicant's seal being formed by the opposition between a sharp edge and an axially facing surface, distinguishes from the prior art, including Mau. In addition to the sharp edge aspect, applicant's claimed structure has an annular groove around the sharp edge, in which the corrugation forms a protruding bead that seals with the compressible gasket according to claims 3 and 20. This aspect distinguishes from the prior art including Mau. Applicant's seal forms a bead or torus, in addition to the seal between edge 90 and axially facing opposed surface 104, and in that way provides applicant the further advantage of a toroidal sealing body whose surface can bear against a compression gasket placed in this same annular groove.

In Mau, the bead is flattened between parallel conical clamping surfaces. There is no disclosure or suggestion of how it might be advantageous or possible to achieve an improved seal in May by failing to flatten the bead. Mau is cited in combination with Laney. Although Laney discloses an O-ring, it is not disclosed or suggested to be useful in connection with a structure that is remotely similar to applicant's structure. Nor is there any reason apparent from Mau or from Laney to believe that a person of ordinary skill could routinely restructure the Mau or Laney seals to somehow incorporate selected aspects from one another. Even assuming that some sort of combination was attempted, there is no basis to assert that the result would be applicant's invention claimed as a whole.

Applicant's claims have been amended to more particularly and distinctly define the invention and to positively recite the aspects by which applicant's developments differ from the seals of Mau and Laney. The claims as amended are definite. The differences between the invention and the prior art are such that the subject matter claimed, as a whole, is not shown to have been known or obvious. The application is in condition for allowance.

Reconsideration and allowance of the pending claims are requested.

Respectfully submitted,

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